

A REVISION OF THE GENUS *BOSISTOA* (RUTACEAE) *

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THE RAIN FORESTS of eastern Australia harbor a number of endemic, apparently relict genera of the Rutaceae. One such genus is *Bosistoa* F. Mueller ex Benth, which consists of seven species of understory or sub-canopy trees and ranges from the Cape York Peninsula south to northeast New South Wales (see MAPS 1-3).

Benth described *Bosistoa* in 1863, basing it on *Euodia pentacocca* F. Mueller. In this original description the illegitimate name *Bosistoa sapindiformis* F. Mueller ex Benth was used for the type species. This plant is now correctly known as *B. pentacocca* (F. Mueller) Baillon. Since 1863, three other species have been described in the genus, *B. euodiiformis* F. Mueller, *B. connaricarpa* Domin, and *B. transversa* Bailey & White. *Bosistoa euodiiformis* has proven to be out of place in this assemblage, and I have recently (Jour. Arnold Arb. 58: 176. 1977) transferred it to *Acradenia* (Rutaceae).

The genus *Pagetia* F. Mueller, in which three species (*P. medicinalis* F. Mueller, *P. monostylis* F. M. Bailey, and *P. dietrichiae* Domin) have been described, is considered here to be taxonomically synonymous with *Bosistoa*. Although there are considerable differences in leaf characteristics between the type species of the two genera, *Bosistoa pentacocca* and *Pagetia medicinalis* (the former having pinnately compound, crenately or serrately margined leaves, and the latter having predominantly unifoliate, entire leaves), there are no fundamental differences in reproductive characters, and there are significant bud similarities. Also, when a range of material of the other taxa of *Bosistoa* and *Pagetia* is examined, it becomes evident that the significance of the leaf differences between the two type species breaks down.

Bosistoa is distinguishable from all of the known genera of the Rutaceae in the Indo-Pacific region in having the following combination of characters: opposite leaves, 5-merous flowers, multi-ovulate carpels, and follicular fruits.

The Australian rain forest genus *Bouchardatia* Baillon (not including *Bouchardatia cyanosperma* Ridley, described from New Guinea) appears to be the closest relative of *Bosistoa*. The main differences and similarities between these two genera are given below.

<i>Bosistoa</i>	<i>Bouchardatia</i>
Leaves opposite	Leaves opposite
Leaves without domatia	Leaves with domatia
Leaf and floral primordia enclosed by bud scales	Leaf and floral primordia not enclosed by bud scales
Inflorescences terminal or terminal and upper axillary	Inflorescences terminal or terminal and upper axillary

* This is the tenth in a series of papers on the Rutaceae of Malesia and Australasia.

Sepals, petals, and carpels 5
 Stamens 10
 Ovules 4–6 per carpel
 Testa pergamentaceous
 Endosperm absent

Sepals, petals, and carpels 4
 Stamens 8
 Ovules 6–8 per carpel¹
 Testa pergamentaceous
 Endosperm scant

This study is based on herbarium specimens. The contributing herbaria are as follows, with abbreviations, where available, from Holmgren and Keuken's *Index Herbariorum*, Part 1. ed. 6 (Reg. Veg. 92. 1974); Arnold Arboretum of Harvard University, Cambridge (A); Bernice P. Bishop Museum, Honolulu (BISH); British Museum (Natural History), London (BM); Queensland Herbarium, Brisbane (BRI); Botanical Survey of India, Calcutta (CAL); C.S.I.R.O. Herbarium Australiense, Canberra (CANB); New South Wales Forestry Commission, Coffs Harbour (COFFS HARBOUR); Gray Herbarium of Harvard University, Cambridge (GH); Allgemeine Botanik, Hamburg (HBG); Royal Botanic Gardens, Kew (K); Rijksherbarium, Leiden (L); National Herbarium of Victoria, Melbourne (MEL); National Herbarium of New South Wales, Sydney (NSW); New York Botanical Garden, New York (NY); Muséum National d'Histoire Naturelle, Paris (P); Botanical Department, National Museum, Prague (PR); C.S.I.R.O. Queensland Research Station, Atherton (QRS); Botanical Museum and Herbarium, Utrecht (U); Herbarium of the University of California, Berkeley (UC); National Museum of Natural History (Department of Botany), Smithsonian Institution, Washington, D.C. (US); and Naturhistorisches Museum, Wien (W).

Bosistoa F. Mueller ex Benth, *Fl. Austral.* 1: 359. 1863. TYPE SPECIES: *Euodia pentacocca* F. Mueller [*Bosistoa pentacocca* (F. Mueller) Baillon].

Pagetia F. Mueller, *Frag. Phytogr. Austral.* 5: 178. 1866. TYPE SPECIES: *Pagetia medicinalis* F. Mueller.

Small to medium trees; indumentum of simple trichomes; buds with scales completely enclosing the leaf and floral primordia. Leaves opposite, imparipinnate, pinnately trifoliolate, or unifoliolate, pinnately veined, with pellucid oil dots. Inflorescences paniculate, many-flowered, terminal or terminal and from the axils of the upper leaves. Flowers bisexual, globose in bud; sepals 5, pellucid-dotted, connate or distinct, basally imbricate or valvate, persistent or deciduous in fruit; petals 5, white, pellucid-dotted, distinct, valvate, hoodlike and somewhat hooked adaxially at the apex, becoming reflexed, deciduous in fruit; stamens 10, at anthesis the antesealous about as long as the petals and the antepetalous slightly shorter, filaments glabrous, straight, linear to narrowly lanceolate, tapering to a subulate apex, anthers 2-celled, versatile, dehiscing by longitudinal slits, elliptic; disc intrastaminal, pulvinate to columnar, angled or slight-

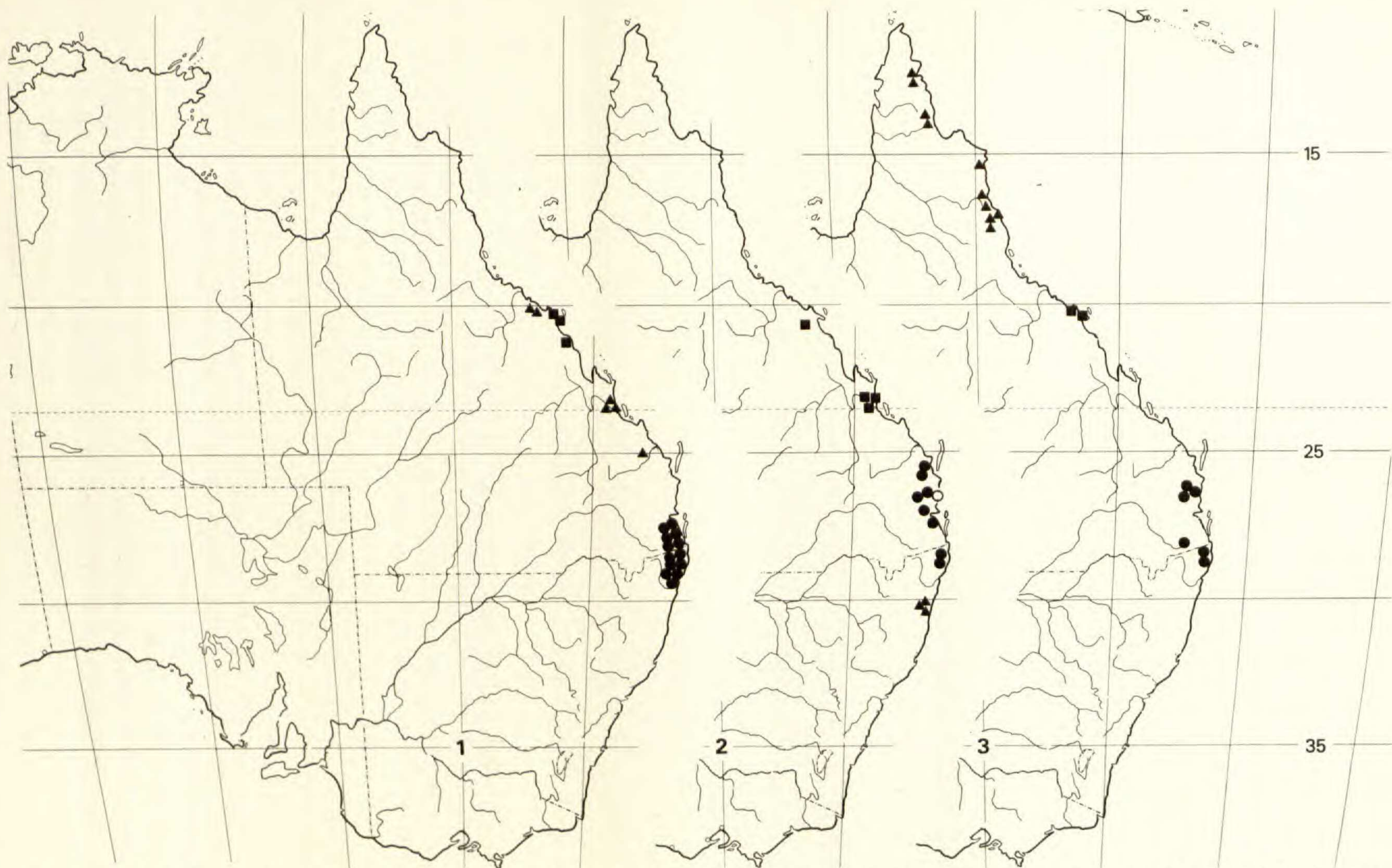
¹ Baillon, in the original description of *Bouchardatia* (*Adansonia* 7: 351. t. 10. 1867), gives the number of ovules per carpel as "... usque ad 12." The most I have seen is 8, and the usual number is 6.

ly lobed between the filaments; gynoecium 5-carpellate, carpels basally connate and joined adaxially at about the middle by a single style, otherwise contiguous and forming a 5-lobed ovary, carpels 1-locular, placentation axile, ovules 4–6 per locule, in 2 rows and closely clustered, style straight, composed of 5 styler elements twisted together, stigma scarcely differentiated from the style. Fruit of 1 or 2, 1-seeded follicles, undeveloped carpels persistent; follicles ellipsoid to obovoid to subglobose, often truncate apically, somewhat compressed laterally, dehiscent along the adaxial and apical edges and partially down the abaxial edge, epicarp dry at maturity, subwoody, endocarp cartilaginous, discharged (probably forcibly) with the seed. Seed ovoid to ellipsoid to reniform; testa brown, smooth, polished, pergamentaceous; endosperm absent; embryo straight or nearly so, cotyledons plano-convex, emarginate at the point of attachment of the hypocotyl, hypocotyl terminal or subterminal.

The bud scales of *Bosistoa* are of a highly specialized type that is generally associated with deciduous trees and shrubs of cold temperate regions of the world. Their presence in this genus of evergreen, tropical and subtropical rain forest trees can probably be taken as evidence that they are vestigial, having been carried over from a time when ancestral populations lived in a cold climate. This immediately suggests that *Bosistoa* may have South American ancestry, and that migrating and evolving populations, during the late Cretaceous and early Tertiary, passed through cold southern latitudes. To my knowledge, however, none of the extant South American genera is very closely related to *Bosistoa*.

I have not seen bud scales of the *Bosistoa* type (i.e., completely enclosing the bud) in any of the other Australasian-Malesian Rutaceae. There are, however, acicular scales associated with the buds of a few of the Australian species described in *Melicope*.

Features of the buds and bud scales of *Bosistoa* are illustrated in FIGURE 1. There are three buds at the shoot apex, one terminal and one in the axil of each of the uppermost pair of leaves. Each bud has two pairs of scales, one outer and one inner. The two scales of each pair are convolute in bud, and the outer pair completely encloses the inner pair. With the opening of the bud and subsequent elongation of the shoot, the scales of the outer pair fall off and those of the inner pair enlarge to form a protective covering for the new leaves or new inflorescence (FIGURE 1b). As the shoot continues to elongate, the enlarged inner bud scales fall off, leaving a pair of overlapping scars where they were attached to the shoot (FIGURE 1c). The fully enlarged inner bud scales (one is shown in FIGURE 1d) lack chlorophyll and range in length from about 2 cm., in *B. brassii*, to about 6 cm., in *B. pentacocca*. In three of the species, *B. pentacocca*, *B. transversa*, and *B. selwynii*, the fully enlarged inner bud scales are remote, in their point of attachment to the shoot, from the scars of the outer pair of scales: in floral shoots they are attached just below the lowermost pair of branches of the inflorescence and in vegetative shoots they are attached about midway between the scars of the outer bud scales and the pair of new leaves. (The remote position of the inner bud scale



MAPS 1-3. Distributions of *Bosistoa* species: 1, *B. pentacocca* (F. Mueller) Baillon var. *pentacocca* (dots), *B. pentacocca* var. *connaricarpa* (Domin) Hartley (triangles), and *B. pentacocca* var. *dryanderensis* Hartley (squares); 2, *B. selwynii* Hartley (dots), *B. floydii* Hartley (triangles), *B. monostylis* (F. M. Bailey) Hartley (circle), and *B. medicinalis* (F. Mueller) Hartley (squares); 3, *B. transversa* Bailey & White (dots), *B. brassii* Hartley var. *brassii* (triangles), and *B. brassii* var. *proserpinensis* Hartley (squares).

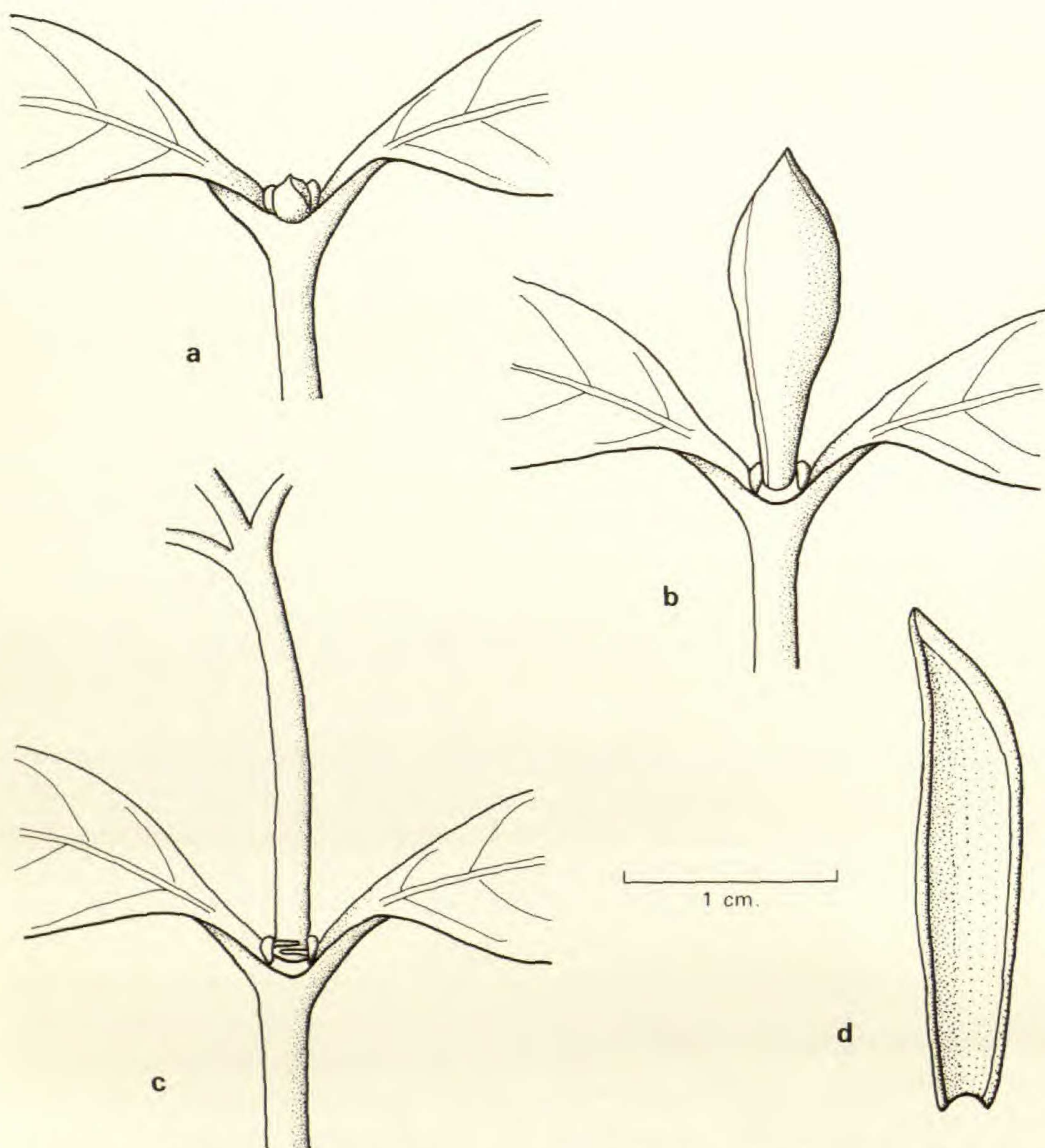


FIGURE 1. Features of buds, bud scales, and bud scale scars of *Bosistoa brassii* Hartley var. *brassii*: a, branchlet apex showing terminal bud and two axillary buds; b, branchlet apex shortly after opening of terminal bud (outer bud scales have fallen, leaving two (one shown) scars; inner pair of bud scales has enlarged and encloses new inflorescence); c, stage after further elongation of inflorescence, showing bases of lowermost pair of branches of inflorescence, and, directly above the scar of an outer bud scale, overlapping scars of caducous inner pair of bud scales; d, fully enlarged inner bud scale fallen from new shoot.

scars of *B. selwynii* is shown in FIGURE 2a.) Also, in these three species, the enlarged inner bud scales usually have minute axillary buds when they are associated with vegetative shoots. They lack such buds, however, when associated with an inflorescence. In a second group of species comprised of *B. floydii*, *B. monostylis*, *B. medicinalis*, and *B. brassii*, the fully enlarged inner bud scales are attached directly above the scars of the outer bud scales (as is shown in FIGURE 1b) and lack, in both vegetative and floral shoots, axillary buds.

Leaf complexity is unusually variable in *Bosistoa*, ranging from imparipinnate to pinnately trifoliolate to unifoliolate. The leaves are consistently imparipinnate in *B. pentacocca* var. *pentacocca* and *B. floydii*; they range from imparipinnate to pinnately trifoliolate in *B. pentacocca* var. *connaricarpa* and *B. pentacocca* var. *dryanderensis*, from pinnately trifoliolate to unifoliolate in *B. transversa*, *B. monostylis*, and *B. medicinalis*; and they are consistently unifoliolate in *B. selwynii* and *B. brassii*.

It seems reasonably certain that the unifoliolate leaf represents a derived condition in the genus and that the imparipinnate leaf is the primitive type. The distal region of the petiole of the unifoliolate leaf is often swollen and/or articulate and thus appears to be homologous with the petiolule (which also may be swollen and is usually articulated with the rachis) of the compound leaf. This apparent retention of the petiolule, or vestiges of it, in the unifoliolate leaf, supports the view that the evolutionary trend in leaf complexity is one of reduction. Such a rudimentary petiolule, as this swollen and/or articulate portion of the petiole might be described, is consistently present in the unifoliolate leaves of *B. transversa* and may or may not be present in the unifoliolate leaves of *B. monostylis* and *B. medicinalis*. The leaves of *B. selwynii* and *B. brassii* have neither swelling nor articulation associated with the petiole, and I am assuming, in describing them as unifoliolate, that they are derived from compound leaves, but that all outward traces of the petiolule have been lost in the course of their evolution.

The terminal inflorescence in *Bosistoa* originates from the middle bud of the three found between the uppermost pair of leaves of the shoot. The two lateral buds of the three may form upper axillary inflorescences, or they may remain dormant during the flowering period and later form vegetative shoots.

As is pointed out above, the species of *Bosistoa* can be divided into two groups based on the relative positions of the inner and outer bud scales in the elongating shoot and on the presence or absence of axillary buds associated with the enlarged bud scales. This classification is given below.

Fully enlarged inner bud scales, or their scars, remote from the scars of the outer bud scales. Axillary buds usually associated with the fully enlarged inner bud scales, or their scars, in vegetative shoots. GROUP I.

1. *B. pentacocca*
2. *B. transversa*
3. *B. selwynii*

Fully enlarged inner bud scales, or their scars, directly above the scars of the outer bud scales. Axillary buds not associated with the fully enlarged inner bud scales, or their scars. GROUP II.

4. *B. floydii*
5. *B. monostylis*
6. *B. medicinalis*
7. *B. brassii*

On the assumption that these are natural groups of species, it appears that the species in Group I represent a comparatively primitive condition in

the genus, because, in having axillary buds, the enlarged inner bud scales of the vegetative shoots are more nearly homologous to true leaves than are those of the species in Group II. The longer internode between the outer and inner bud scales in the elongating shoot of the species in Group I is probably also the primitive condition from which the short internode of the species in Group II was derived.

Within each of the two groups the species are arranged in order of decreasing leaf complexity, following what is quite certainly an evolutionary trend in the genus. Thus, in Group I, the leaves of *Bosistoa pentacocca* (var. *pentacocca*) are imparipinnate, and those of *B. selwynii* are unifoliolate; in Group II, the leaves of *B. floydii* are imparipinnate, and those of *B. brassii* are unifoliolate.

This classification cuts across the traditional line of distinction between *Bosistoa* and *Pagetia*, which was based on differences in leaf complexity (compound, in *Bosistoa*, vs. unifoliolate, or predominantly unifoliolate, in *Pagetia*). *Bosistoa selwynii*, with unifoliolate leaves, is here more closely related to *B. pentacocca*, with pinnately compound leaves, than it is to *B. brassii*, with unifoliolate leaves; and *B. floydii*, with pinnately compound leaves, is more closely related to *B. brassii* than it is to *B. pentacocca*.

KEY TO THE SPECIES

1. Bud scales, at least in younger buds, pubescent; ovary woolly or hispidulous-velutinous; mature follicles densely to rather sparsely pubescent, 0.8–2.5 cm. wide.
 2. Leaves unifoliolate. 3. *B. selwynii*.
 2. Leaves, or at least some of them, compound.
 3. Scars of inner pair of bud scales directly above those of outer pair; ovary hispidulous-velutinous; mature follicles sparsely pubescent, 0.8–1 cm. wide. 4. *B. floydii*.
 3. Scars of inner pair of bud scales remote from those of outer pair; ovary woolly; mature follicles densely and minutely pubescent, 1–2.5 cm. wide.
 4. Petals glabrous abaxially; leaves imparipinnate or pinnately trifoliolate; follicles 1.5–2.5 cm. wide. 1. *B. pentacocca*.
 4. Petals pubescent abaxially; leaves pinnately trifoliolate or occasional leaves unifoliolate; follicles about 1 cm. wide.
. 2. *B. transversa*.
1. Bud scales glabrous; ovary sparsely and minutely hispidulous, sparsely villous, or glabrous; mature follicles, where known, glabrous, 0.8–1 cm. wide.
 5. Ovary sparsely and minutely hispidulous; leaves unifoliolate or occasional leaves trifoliolate. 6. *B. medicinalis*.
 5. Ovary sparsely villous to glabrous.
 6. Leaves trifoliolate or occasional leaves unifoliolate.
. 5. *B. monostylis*.
 6. Leaves unifoliolate. 7. *B. brassii*.

1. *Bosistoa pentacocca* (F. Mueller) Baillon, Hist. Pl. 4: 470. 1873.

Three nearly allopatric varieties are recognized in this species (see MAP 1).

KEY TO THE VARIETIES

1. Leaflet margin usually crenate or serrate, main veins 16–30 on each side of the midrib.
 2. Leaves imparipinnate, 14–45 cm. long; leaflets (3–)4–5(–6) pairs. 1a. var. *pentacocca*.
 2. Leaves imparipinnate or pinnately trifoliolate, 9–30 cm. long; leaflets 1–2 pairs. 1b. var. *connaricarpa*.
1. Leaflet margin entire, main veins 13–16 on each side of the midrib. 1c. var. *dryanderensis*.

1a. *Bosistoa pentacocca* (F. Mueller) Baillon var. *pentacocca*.

Euodia pentacocca F. Mueller, Frag. Phytogr. Austral. 3: 41. 1862. TYPE: Beckler, New South Wales, Clarence River.

Bosistoa sapindiformis F. Mueller ex Benth, Fl. Austral. 1: 359. 1863, *nomen illegit.*, based on *Euodia pentacocca* F. Mueller.

Acradenia bosistoi F. Mueller, Pap. Proc. Roy. Soc. Tasmania 8: 8. 1868, and Frag. Phytogr. Austral. 6: 167. 1868, *nomen illegit.*, based on *Euodia pentacocca* F. Mueller.

Small to medium tree to about 18 m.; branchlets densely pubescent in new growth, becoming glabrous; buds pubescent; scars of inner pair of bud scales remote from those of outer pair. Leaves imparipinnate, 14–45 cm. long; petiolules of lateral leaflets obsolete to 8 mm. long, terminal leaflet on an extension of the rachis 5–25 mm. long; leaflets (3–)4–5(–6) pairs, chartaceous to subcoriaceous, glabrous, elliptic-oblong to narrowly elliptic or (most terminal leaflets) oblanceolate, 9–27 cm. long, 1.5–7 cm. wide, base acute to obtuse or occasionally rounded, margin crenate to coarsely and bluntly serrate, apex acuminate, the acumen to 4 cm. long, main veins 20–30 on each side of the midrib. Inflorescence terminal, (10–)15–20(–33) cm. long, peduncle and lower axis densely pubescent, upper axis and branches sparsely and finely pubescent. Flowers 4.5–5.5 mm. long; sepals glabrous or nearly so, connate, forming a minutely 5-lobed calyx cup about 1 mm. high, persistent in fruit; petals glabrous, broadly oblanceolate, about 4.5 mm. long; stamens with narrowly lanceolate filaments, anthers about 1.5 mm. long; disc glabrous, columnar, about 0.7 mm. high; ovary woolly, about 1.5 mm. high, ovules 4 per locule; style glabrous, 2–2.5 mm. long. Follicles subglobose to ellipsoid, 1.5–2.5 cm. wide; exocarp densely and minutely pubescent, wrinkled and often transversely ribbed. Seed subellipsoid, 15–20 mm. long.

ILLUSTRATIONS. Engler, A., Nat. Pflanzenfam. III. 4: 113. fig. 64J. 1896 (flower only). *Ibid.* ed. 2. 19a: 215. fig. 92J. 1931 (flower only).

DISTRIBUTION. Southeast Queensland and northeast New South Wales; rain forests, often along streams. See MAP 1.

Queensland. MORETON DISTRICT: Moreton Bay, Mr. Cameron's Brush, *Leichhardt*, March 13, 1844 (NSW 128894, P); Ipswich, *Nernst* (K, MEL); Pimpama, *Herb. Simmonds*, March 18, 1889 (BRI); Coomera, *Scortechini* 168 (MEL); Logan

River, *Scortechini* (BRI); Tamborine Mt., *Blake* 17387 (BRI), *Shirley*, February, 1917 (A, BRI); Kalbar, *Smith*, September, 1935 (BRI); Beech Mountain [probably Beechmont or Beechmont Range], *White* 1912 (A, BRI, NSW, P); upper Albert River, *White* 10370 (A, BM); Canungra, *Boorman*, April, 1907 (NSW 128904, w); Lamington National Park, *Shirley*, March, 1909 (NSW 128903). New South Wales. Tweed River near Mt. Warning, *Anonymous* 63 (MEL); Tweed Valley, Limpinwood Faunal Reserve, near Chillingham, *Williams*, May 31, 1965 (COFFS HARBOUR); Mt. Warning, *Boorman*, August, 1916 (BRI, NSW 128899, US), *Fraser*, January 16, 1936 (NSW 128906); Lynches Creek, *Hayes*, May 8, 1954 (COFFS HARBOUR); Mebbin State Forest, *Floyd & Hayes*, January 23, 1958 (COFFS HARBOUR), *Lemaire*, September 17, 1965 (COFFS HARBOUR); 3.2 km. SW of Wiangaree, *Hayes, Turner, & McGillivray* 2554 (NSW); Toonumbar, *Hayes*, 1954 (COFFS HARBOUR); Whian Whian State Forest, *de Beuzeville* LXVII (A, NSW); north arm of Richmond River, *Anonymous* (MEL); Byron Creek, Booyong Creek, *Johnson & Constable*, June 11, 1957 (NSW 128890); Wilson's Creek, *Anonymous* 19 (NSW); rain forest reserve near Booyong, *Johnson, Constable, & Hayes*, June 11, 1957 (COFFS HARBOUR); Lismore, *Anonymous*, January, 1894 (CAL, NSW 135636, US), *Baeuerlen*, June, 1891 (A, NSW 135632), *Forest Guard*, March, 1909 (L, NSW 135635), April, 1909 (NSW 128895), August 27, 1909 (NSW 135633, PR), October 18, 1909 (BISH, UC), *Rothwell*, November, 1906 (NSW 128893); Tintenbar, *Baeuerlen*, October, 1893 (NSW 128891, U); Casino, *Rummey*, August, 1916 (NSW 128892); Richmond River, *Henderson* 156 (MEL); Tweed and Richmond Rivers, *Anonymous* 66 (MEL); Ballina, *Anonymous*, February, 1894 (MEL); Clarence River, *Beckler* (MEL, holotype of *Euodia pentacocca* F. Mueller; K, isotype).

1b. *Bosistoa pentacocca* (F. Mueller) Baillon var. *connaricarpa* (Domin) Hartley, comb. & stat. nov.

Bosistoa connaricarpa Domin, in Feddes Repert. 12: 390. 1913, and Bibliot. Bot. 22(89): 288. 1927. TYPE: *Dallachy*, February 5, 1863, Queensland, Rockhampton.

Small tree; branchlets finely pubescent in new growth, becoming glabrous; buds pubescent; scars of inner pair of bud scales remote from those of outer pair. Leaves imparipinnate or pinnately trifoliolate, 9–30 cm. long; petiolules of lateral leaflets 1–6 mm. long, extension of the rachis subtending terminal leaflet obsolete to 33 mm. long; leaflets 1 or 2 pairs, subcoriaceous, glabrous, oblanceolate or occasionally elliptic or narrowly elliptic, 4.5–22 cm. long, 2–9 cm. wide, base cuneate to acute or obtuse, occasionally oblique in lateral leaflets, margin crenate to coarsely and bluntly serrate or occasionally entire, apex acuminate, the acumen to 1.5 cm. long, main veins 16–24 on each side of the midrib. Inflorescences terminal or terminal and from the axils of upper leaves, 5–10 cm. long, peduncle and branches rather sparsely and finely pubescent. Flowers about 4 mm. long; sepals glabrous, basally connate, triangular, about 0.7 mm. long, persistent in fruit; petals glabrous, subelliptic, about 3.5 mm. long; stamens with sublinear filaments, anthers 1.2 mm. long; disc glabrous, columnar, about 0.5 mm. high; ovary woolly, about 1.5 mm. high, ovules

4 per locule; style glabrous, about 1 mm. long. Follicles truncately subglobose, 1.8–2.3 cm. wide; exocarp densely and minutely pubescent, wrinkled. Seed not seen.

DISTRIBUTION. East central Queensland, from Bowen south to Gin Gin; rain forests. See MAP 1.

Queensland. NORTH KENNEDY DISTRICT: Port Denison [Bowen], *Fitzalan*, 1874 (L, MEL); Edgecumbe Bay, *Anonymous* (W). PORT CURTIS DISTRICT: Mt. Archer [at Rockhampton], *Anonymous* (MEL); Fitzroy River, *O'Shanesy* 86 ser. 9 (MEL); Rockhampton, *Anonymous* (BM, L, P, U), *Herb. Hance* 10552 (BM, P), *Dallachy*, February 5, 1863 (MEL, isotype of *Bosistoa connaricarpa* Domin), *Thozet* (GH, MEL, P). WIDE BAY DISTRICT: Gin Gin, *Scortechini* 305 (MEL).

1c. *Bosistoa pentacocca* (F. Mueller) Baillon var. *dryanderensis*
Hartley, var. nov.

Arbor parva usque ca. 10 m. alta; ramulis glabratis; gemmis pubescentibus; cicatricibus perularum interiorum delapsarum ex cicatricibus perularum exteriorum delapsarum remotis; foliis imparipinnatis, 1–2-jugis, 14–28 cm. longis; petiolulis foliolorum lateralium obsoletis vel usque 4 mm. longis, rhachidi ad apicem extensa 10–25(–40) mm. longa foliolum terminale ferente; foliolis subcoriaceis vel coriaceis, glabris, anguste vel late ellipticis vel oblanceolatis vel obovatis, 8–20 cm. longis, 2.5–7.5 cm. latis, basi acutis vel obtusis vel cuneatis, plerumque inaequilateribus in foliolis lateralibus, margine integris, apice acuminatis, acumine usque 2.5 cm. longo, venis primariis utrinsecus costa 13–16; inflorescentiis terminalibus vel terminalibus et ex axillis foliatis superioribus orientibus, 10–23 cm. longis, pedunculo sparse et subtiliter pubescentibus, ramis puberulis; floribus (visi tantum in alabastro) ca. 4 mm. longis; calyce glabro, cupulato, ca. 1 mm. alto, minute 5-lobato, in fructu persistenti; petalis glabris; staminibus filamentis sublinearibus, antheris 1–1.3 mm. longis; disco glabro, columnari, ca. 0.5 mm. alto; ovario lanato, ca. 1 mm. alto, ovulis in quoque loculo 4; stylo glabro, ca. 2 mm. longo; folliculis truncate obovoideis, 1.5–1.7 cm. latis; exocarpio dense et minute pubescenti, rugoso; semine subreniformi, ca. 10 mm. longo. HOLOTYPE: *Moriarty* 968 (CANB).

DISTRIBUTION. East central Queensland, in the vicinity of Mt. Dryander and at Mackay; rain forests to about 150 meters. See MAP 1.

Queensland. NORTH KENNEDY DISTRICT: Mt. Dryander, *Jones* 3216 (CANB), *Kilmer & Fitzalan* (MEL), *Michael* 708, in part (GH), *Moriarty* 968 (CANB, holotype; BRI, isotype), *Webb & Tracey* 10067 (BRI); State Forest Reserve 299, Conway Logging Area, *Hyland* RFK 4071 (CANB), RFK 4072 (CANB); Mt. Marlow, *Michael* 708, in part (BRI). SOUTH KENNEDY DISTRICT: Mackay, *Nugent* 11 (BRI). Without definite locality: *Macpherson* 122 (*North Qld. Herb.* 4409) (QRS).

2. *Bosistoa transversa* Bailey & White, Queensl. Dept. Agr. Bot. Bull. 19: 7. t. 2. 1917. LECTOTYPE (chosen here): *Francis & White*, March, 1916, Queensland, Kin Kin.

Small to medium tree to about 15 m.; branchlets glabrous or nearly so; buds pubescent (sometimes sparsely); scars of inner pair of bud scales remote from those of outer pair. Leaves pinnately trifoliolate (occasional leaves bifoliolate or unifoliolate), 8.5–16 cm. long; petiolules of lateral leaflets obsolete to 5 mm. long, terminal leaflet on an extension of the rachis 8–25 mm. long, petioles of unifoliolate leaves 5–12 mm. long; leaflets subcoriaceous to coriaceous, glabrous, elliptic-oblong to broadly elliptic, 4–12.5 cm. long, 1–6 cm. wide, base cuneate to rounded, usually oblique in lateral leaflets, margin entire, apex bluntly acuminate (the acumen to 2 cm. long) or occasionally acute or obtuse, main veins 9–12 on each side of the midrib. Inflorescences terminal or terminal and from the axils of upper leaves, 7–16 cm. long, peduncle and branches finely pubescent to puberulent. Flowers about 3.5 mm. long; sepals pubescent, basally connate, triangular, 0.7–1 mm. long, persistent in fruit; petals pubescent abaxially, sparsely pubescent adaxially, broadly elliptic, about 3 mm. long; stamens with sublinear filaments, anthers about 1 mm. long; disc glabrous, pulvinate, about 0.3 mm. high; ovary woolly, about 0.7 mm. high, ovules 4 per locule; style pubescent toward the base, glabrous above, about 1.2 mm. long. Follicles obovoid, 1–1.3 cm. wide; exocarp densely and minutely pubescent, transversely ribbed. Seed reniform, about 10 mm. long.

ILLUSTRATION. J. F. Bailey & C. T. White, *loc. cit.*

DISTRIBUTION. Southeast Queensland and northeast New South Wales; rain forests to 150 meters. See MAP 2.

Queensland. WIDE BAY DISTRICT: Kin Kin, *Francis*, May, 1919 (A, BM), *Francis & White*, March, 1916 (BRI, lectotype), *White*, January, 1917 (BM, BRI, CANB); Imbil, State Forest Reserve 256, Mitchell Logging Area, *Moriarty 1641* (BRI, CANB); Imbil, *Deputy Forester Cochrane*, July 25, 1923 (BRI), *Dun*, 1950 (COFFS HARBOUR), *Jones 3288* (CANB), *King*, 1949 (COFFS HARBOUR), *Smith & Webb 3121* (BRI, NY). MORETON DISTRICT: Eumundi, *Bailey*, May, 1892 (BRI), May 1, 1896 (BRI), *Herb. Simmonds*, January, 1892 (BRI). DARLING DOWNS DISTRICT: Gladfield, *Bailey* (NSW 128897). New South Wales. Tweed River, *Moore 212* (K); Mullimbimby, Tongoggin Mt., *Baenerlen*, February, 1895 (NSW).

The lectotype is one of two collections (the other being *Bailey*, May, 1892, from Eumundi) cited in the original description of *Bosistoa transversa*.

Collectors have sometimes confused *Bosistoa transversa* with *Bouchardatia neurococca* (F. Mueller) Baillon, and *Francis* (Austral. Rain-forest Trees, ed. 3. 175. 1970) expressed doubt that the two can be separated. A good spot character for the recognition of *Bouchardatia* is found in the presence of domatia in its leaves. This and other distinguishing features of the two genera are given in the introductory part of this paper.

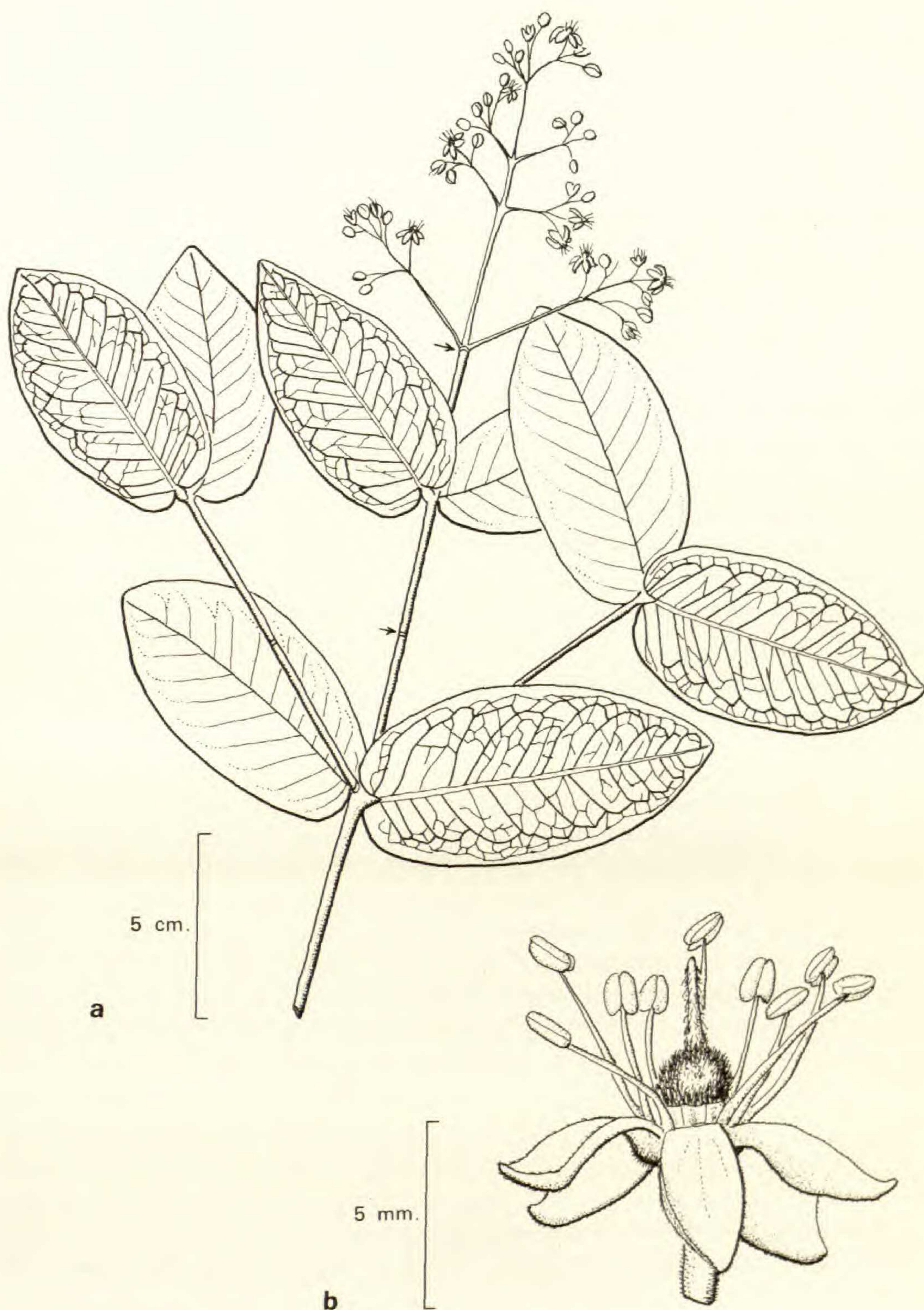


FIGURE 2. *Bosistoa selwynii* Hartley: a, flowering branchlet, showing pronounced venation of lower surface of four leaves (note remote position of inner bud scale scars (arrows) on vegetative shoots and inflorescence); b, flower with one stamen removed (both drawn from *Moriarty 1644*).

3. *Bosistoa selwynii* Hartley, sp. nov.

FIGURE 2.

Arbor parva vel mediocris usque ca. 22 m. alta; ramulis glabratibus; gemmis pubescentibus; cicatricibus perularum interiorum delapsarum ex cicatricibus perularum exteriorum delapsarum remotis; foliis unifoliolatis, 5.5–13.5 cm. longis; petiolo obsoleto vel usque 8 mm. longo; foliolo subcoriaceo vel coriaceo, omnino glabro vel subtus subtiliter et sparse pubescenti, ovato vel elliptico vel interdum suborbiculari, 5–13 cm. longo, 2.5–9 cm. lato, basi cordato vel interdum acuto, obtuso, vel rotundato, aequilatero, margine integro, apice acuto vel rotundato vel interdum acuminato, acumine usque 1.5 cm. longo, venis primariis utrinsecus costa 9–12; inflorescentiis terminalibus vel terminalibus et ex axillis foliatis superioribus orientibus, 6–10 cm. longis, pedunculo et ramis subtiliter pubescentibus; floribus 4–5.5 mm. longis; sepalis pubescentibus, basaliter connatis, triangularibus, 0.8–1.5 mm. longis, in fructu persistentibus; petalis abaxialiter pubescentibus, adaxialiter sparse pubescentibus, late ellipticis, 3.5–4.5 mm. longis; staminibus filamentis sublinearibus, antheris 0.8–2 mm. longis; disco glabro, pulvinato, 0.5–1 mm. alto; ovario lanato, 1–1.5 mm. alto, ovulis in quoque loculo 4; stylo sparse pubescenti, 1.5–3 mm. longo; folliculis truncate obovoideis, ca. 1 cm. latis; exocarpio dense et minute pubescenti, transverse costato; semine subreniformi, ca. 10 mm. longo. HOLOTYPE: *Moriarty 1644* (CANB).

DISTRIBUTION. Southeast Queensland and northeast New South Wales; rain forests to 300 meters. See MAP 2.

Queensland. WIDE BAY DISTRICT: Maryborough District, *Petrie 8a* (BRI); Oakview [near Kilkivan], Forest Reserve 220, Sinai, *Forest Overseer Reynolds*, April 18, 1923 (BRI); Imbil, *Deputy Forester Cochrane* (BRI), *Fraser 134* (BRI); Imbil, State Forest Reserve 135, Little Derrier Logging Area, *Moriarty 1642* (BRI, CANB), *1643* (CANB), *1644* (CANB, holotype; BRI, isotype); near Imbil, *Smith & Webb 3134* (BRI, CANB). MORETON DISTRICT: Kilcoy, *England*, March, 1937 (BRI); Mt. Glorious, Cedar Creek, *White 1940* (A, BO, BRI, NSW, US). New South Wales. Limpinwood Nature Reserve, Oxley River, *Floyd*, November 26, 1976 (COFFS HARBOUR); Whian Whian State Forest, about 24 km. N of Lismore, *Smith 5137* (BRI).

Collectors have confused this species, *Bosistoa selwynii*, with *Pagetia dietrichiae* Domin, apparently because the latter was originally described as having been collected from near Brisbane. As is pointed out below under *Bosistoa medicinalis*, the syntypes of *Pagetia dietrichiae* probably all came from the vicinity of Rockhampton.

This species is named in honor of Selwyn L. Everist, former director of the Queensland Herbarium and authority on Australian poisonous plants.

4. *Bosistoa floydii* Hartley, sp. nov.

FIGURE 3.

Arbor mediocris usque ca. 15 m. alta; ramulis glabris; gemmis pubescentibus; cicatricibus perularum interiorum delapsarum ex cicatricibus perularum exteriorum delapsarum proxime super; foliis imparipinnatis, 2-jugis (saepe

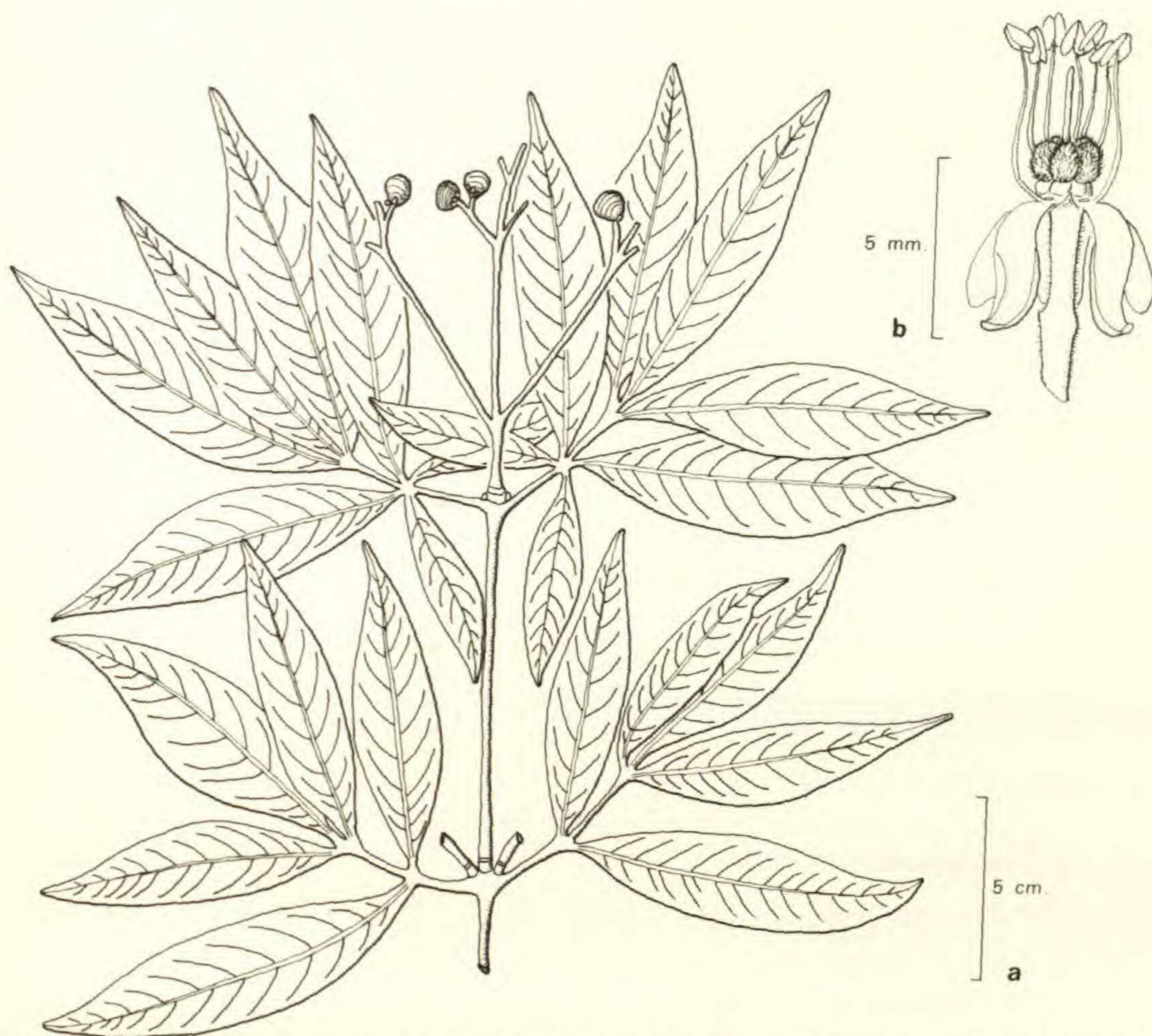


FIGURE 3. *Bosistoa floydii* Hartley: a, fruiting branchlet, two axillary shoots removed from lower node (drawn from *Floyd*, February 25, 1975); b, flower, three stamens removed (drawn from *Floyd*, October 21, 1974).

foliolis duo adjectis redactis reflexis in nodo infimo), 11–28 cm. longis; petiolulis foliolorum lateralium obsoletis vel usque 8 mm. longis, rhachidi ad apicem extensa 1–13 mm. longa foliolum terminale ferente; foliolis subcoriaceis, glabris, anguste ellipticis vel ellipticis, 8–16 cm. longis, 2–5 cm. latis (foliolis redactis, quum praesentibus, 4–6.5 cm. longis, 0.7–1.5 cm. latis), basi cuneatis vel attenuatis, saepe inaequilateris in foliolis lateralibus, margine integris, apice acuminatis, acumine usque 3 cm. longo, venis primariis utrinsecus costa 16–20; inflorescentia terminali, 10–16 cm. longa, pedunculo glabro vel fere glabro, ramis sparse et minute pubescentibus; floribus 5–6 mm. longis; sepalis margine ciliatis, aliter glabris, basaliter connatis, triangularibus, ca. 1 mm. longis, in fructu persistentibus; petalis glabris, oblanceolatis, 4–5 mm. longis; staminibus filamentis linearibus, antheris ca. 1 mm. longis; disco glabro, pulvinato, 0.5–0.6 mm. alto; ovario sparse vel dense hispidulo-velutino, ca. 1 mm. alto, ovulis in quoque loculo 5; stylo glabro, ca. 2 mm. longo; folliculis oblique obovoideis vel subglobosis, 0.8–1 cm. latis; exocarpio sparse pubescenti, transverse costato; semine late ellipsoideo, ca. 7 mm. longo. HOLOTYPE: *Floyd*, February 25, 1975 (CANB).

DISTRIBUTION. Northeast New South Wales, vicinity of Dorrigo and Coffs Harbour; rain forests. See MAP 2.

New South Wales. Upper Orara River, *Floyd*, February 23, 1974 (COFFS HARBOUR); Miram Creek, upper Orara River, *Floyd*, October 21, 1974 (COFFS HARBOUR), February 25, 1975 (CANB, holotype); Dorrigo, *Fraser*, January, 1935 (NSW 128907); Dorrigo Forest Reserve, *Anonymous*, October 6, 1896 (NSW 128901); Dorrigo Mountain Park, *Floyd*, November 17, 1958 (COFFS HARBOUR); Dorrigo National Park, *Williams*, December, 1962 (NSW 128900); Oakes State Forest, *Hayes*, January 17, 1962 (COFFS HARBOUR).

As is pointed out above, *Bosistoa floydii* and the next three species, *B. monostylis*, *B. medicinalis*, and *B. brassii*, appear to be more closely related to one another than they are to the other three species of the genus. Beyond this, *B. monostylis*, *B. medicinalis*, and *B. brassii* seem to be closely interrelated, but *B. floydii*, which is very different in its leaf characteristics, is quite distinct.

5. *Bosistoa monostylis* (F. M. Bailey) Hartley, comb. nov.

Pagetia monostylis F. M. Bailey, Queensl. Dept. Agr. Bot. Bull. 13: 7. 1895.

TYPE: F. M. Bailey (*Field Naturalists' Excursion*), November, 1895, Queensland, Eumundi.

Medium tree to about 18 m.; branchlets glabrous; buds glabrous; scars of inner pair of bud scales directly above those of the outer pair. Leaves pinnately trifoliolate (occasional leaves unifoliolate), 8.5–13 cm. long; lateral leaflets sessile or subsessile, terminal leaflet on an extension of the rachis 10–17 mm. long, petioles of unifoliolate leaves 10–20 mm. long; leaflets subcoriaceous, glabrous, elliptic, 7–9.5 cm. long, 2–4 cm. wide, base acute to obtuse, oblique in lateral leaflets, margin entire, apex bluntly acuminate, the acumen to 1 cm. long, main veins 12–15 on each side of the midrib. Inflorescences terminal or terminal and from the axils of upper leaves, 7–10 cm. long, peduncle and axis glabrous, upper branches puberulent. Flowers about 5 mm. long; sepals ciliate at the margin, otherwise glabrous, basally connate, ovate to triangular, about 1 mm. long; petals puberulent abaxially, glabrous adaxially, elliptic, about 4 mm. long; stamens with sublinear filaments, anthers about 1 mm. long; disc glabrous, pulvinate, about 0.5 mm. high; ovary sparsely villous toward the apex, otherwise glabrous, about 1 mm. high, ovules 4 per locule; style glabrous, about 1.5 mm. long. Follicles not seen.

ILLUSTRATION. F. M. Bailey, Comprehensive Cat. Queensl. Pl. 80. t. 61. 1909.

DISTRIBUTION. Known definitely only from the type locality; rain forest. See MAP 2.

Queensland. MORETON DISTRICT: Eumundi, *Bailey* (*Field Naturalists' Excursion*), November, 1895 (BRI, holotype of *Pagetia monostylis* F. M. Bailey; NSW 135603, w, isotypes), *Simmonds*, November, 1895 (BRI, MEL, NSW 135602).

The style in *Bosistoa* is composed of five separate styler elements which are tightly twisted together and are fused apically into a common, more or less undifferentiated stigma. This is a common structure in the Rutaceae and is usually referred to as a single style with a single stigma. Mueller, however, when publishing the genus *Pagetia*, of which *Bosistoa medicinalis* is the type species, described it as follows: "Styli 5 breves, in unicum contorti. Stigmata minuta, coalita." This seems to be just another way of describing the same structure, but it led Bailey to choose the epithet *monostylis* for the present species.

Bosistoa monostylis and *B. medicinalis* are very similar morphologically, and it is with some hesitation that I have decided to recognize them as distinct species. In flower they can be distinguished by the trichomes on the ovary, which are long and more or less flexuous in *B. monostylis* and short and stiff in *B. medicinalis*. In fruiting specimens of the latter species (and probably in the former as well, since there is no reason to suspect that its fruit, which has not been collected, is other than typical for the genus), the nature of this pubescence can generally be determined because it persists for some time on the undeveloped carpels. (As is noted in the generic description, only one or two of the five carpels develop into fruits, and the undeveloped ones are persistent.) Sterile specimens can generally be determined to species by their leaf complexity, which is predominantly trifoliolate in *B. monostylis* and predominantly or entirely unifoliolate in *B. medicinalis*. Nevertheless, there are some predominantly or entirely unifoliolate sterile collections that I have preferred to determine as *B. cf. monostylis*. They are the following:

Queensland. PORT CURTIS DISTRICT: Fitzroy River, *Anonymous* (BO, CAL, L, MEL); Mt. Archer, *Tracey* (CANB). WIDE BAY DISTRICT: Wide Bay, Mr. Archer's Brush, *Leichhardt* (MEL).

Luerssenidendron monostylis Domin, described from northeast New South Wales, has been incorrectly referred to *Pagetia monostylis* (see below under Excluded Species).

6. *Bosistoa medicinalis* (F. Mueller) Hartley, comb. nov.

Pagetia medicinalis F. Mueller, Frag. Phytogr. Austral. 5: 178. 1866. LECTOTYPE (chosen here): *O'Shanesy* 247, Queensland, Rockhampton.

Pagetia dietrichiae Domin, Bibliot. Bot. 22(89): 291. 1927. SYNTYPES: *Dietrich* 643, 1544, 1768, and 2212, Queensland, Brisbane River [probably Rockhampton — see discussion below].

Small to medium tree to about 20 m.; branchlets glabrous; buds glabrous; scars of inner pair of bud scales directly above those of outer pair. Leaves unifoliolate (occasional leaves pinnately trifoliolate or bifoliolate), 5–18 cm. long; petiole 4–10(–15) mm. long (in compound leaves lateral leaflets sessile or subsessile, terminal leaflet on an extension of the rachis 3–14 mm. long); leaflets subcoriaceous to coriaceous, glabrous, obovate to elliptic, ovate, or suborbicular, 5–17 cm. long, 2–8.5 cm. wide (in com-

pound leaves elliptic to narrowly obovate to oblanceolate, 3.5–8.5 cm. long, 1.5–3 cm. wide), base acute to cordate, equal-sided (in compound leaves acute to cuneate, oblique in lateral leaflets), margin entire, apex obtuse to acuminate, the acumen to 1.5 cm. long, main veins 10–13 on each side of the midrib. Inflorescences terminal or terminal and from the axils of upper leaves, 5–8 cm. long, peduncle and axis glabrous, branchlets puberulent. Flowers about 5 mm. long; sepals finely pubescent, ciliate at the margin, basally connate, ovate to triangular, about 1 mm. long, deciduous in fruit; petals puberulent abaxially, glabrous adaxially, broadly elliptic, about 4.5 mm. long; stamens with sublinear filaments; anthers 1–1.5 mm. long; disc glabrous, pulvinate, about 0.5 mm. high; ovary rather sparsely and minutely hispidulous, about 1 mm. high, ovules 4 per locule; style glabrous, about 1.5 mm. long. Follicles obovoid to subglobose, about 1 cm. wide; exocarp becoming glabrous, transversely ribbed. Seed subreniform, about 8 mm. long.

DISTRIBUTION. East central Queensland, vicinities of Proserpine and Rockhampton (see discussion below); rain forests. See MAP 2.

Queensland. NORTH KENNEDY DISTRICT: Kelsey Creek, [near] Proserpine, *Thorogood* 7 (BRI). PORT CURTIS DISTRICT: Rockhampton, *Dietrich* 643 (HBG, PR), 1436 (MEL), 1544 (HBG, MEL, NY, PR), 1768 (HBG, PR), 2212 (HBG, MEL, PR), *O'Shanesy* 247 (MEL, lectotype of *Pagetia medicinalis* F. Mueller), *Thozet*, 1878 (P); Crocodile Creek [near Rockhampton], *Bowman* (MEL); Mt. Buzzard [near Rockhampton], *Dallachy* (MEL).

Of the collections cited above, those of O'Shanesy, Thozet, Bowman, and Dallachy are syntypes cited by Mueller with the original description of *Pagetia medicinalis*. I have chosen the sheet of the O'Shanesy collection as the lectotype.

As interpreted here, *Bosistoa medicinalis* is extremely variable in leaf complexity and leaflet shape. The syntypes of *Pagetia dietrichiae* Domin fall well within this range of variability.

Domin was at least partially misled when he gave the locality of *Pagetia dietrichiae* as Brisbane River. The Dietrich collections he cited had been distributed with printed labels that gave the locality as "prope Brisbane River," but the Hamburg and New York sheets of *Dietrich* 1544 now have a photocopy of a label, in Dietrich's handwriting, giving the locality as Rockhampton. Also, the Melbourne sheets of *Dietrich* 1544 and 2212 have labels (but not in Dietrich's handwriting) giving the locality as Rockhampton. In correspondence with the Hamburg herbarium, we have learned that in Dietrich's catalog of collections there is no locality given for numbers 643, 1768, and 2212, but that numbers 633–637, 650–733, 1767, and 2213 were all collected at Rockhampton, and that number 644 was collected at Mackay. There is no reliable evidence that any of the syntypes of *P. dietrichiae* were collected from the Brisbane River. It is probably worth noting that all four of the syntype collections, and *Dietrich* 1436, which was not cited by Domin, are at the same stage of flowering and otherwise appear to be identical. I think it is likely that they were all collected from the same tree on the same date.

According to Mueller, the oil from the leaves of this species has been used therapeutically; hence his choice of the epithet *medicinalis*.

7. *Bosistoa brassii* Hartley, sp. nov.

Two allopatric varieties are recognized in this species.

KEY TO THE VARIETIES

1. Petiole 3–10 mm. long; leaflet cuneate or occasionally acute to obtuse at the base; ovary sparsely villous. 7a. var. *brassii*.
1. Petiole 1–2.5 mm. long; leaflet obtuse to rounded to subcordate at the base; ovary glabrous. 7b. var. *proserpinensis*.

7a. *Bosistoa brassii* Hartley var. *brassii*.

FIGURE 4.

Arbor parva vel mediocris usque ca. 18 m. alta; ramulis glabris; gemmis glabris; cicatricibus perularum interiorum delapsarum ex cicatricibus perularum exteriorum delapsarum proxime super; foliis unifoliolatis, 6.5–19 cm. longis; petiolo 3–10 mm. longo; foliolo subcoriaceo, glabro, elliptico vel obovato, 7–18.5 cm. longo, 3.5–9 cm. lato, basi cuneato vel interdum acuto vel obtuso, aequilatero, margine integro, apice acuminato, acumine usque 1.5 cm. longo, venis primariis utrinsecus costa 10–16; inflorescentiis terminalibus vel terminalibus et ex axillis foliatis superioribus orientibus, 5–9 cm. longis, pedunculo glabro vel fere glabro, ramulis glabris vel subtiliter pubescentibus; floribus 5–6 mm. longis; sepalis margine ciliatis, aliter glabris, distinctis vel basaliter connatis, anguste triangularibus, ca. 1 mm. longis, in fructu deciduis; petalis abaxialiter apicem versus puberulis, adaxialiter glabris, ellipticis, 4–4.5 mm. longis; staminibus filamentis linearibus, antheris 0.7–0.8 mm. longis; disco glabro, pulvinato, 0.4–0.6 mm. alto; ovario sparse villosa, ca. 1 mm. alto, ovulis in quoque loculo 4; stylo glabro, ca. 2 mm. longo; folliculis subglobosis, ca. 0.8 cm. latis; exocarpio glabro, transverse costato; semine ovoideo, ca. 8 mm. longo. HOLOTYPE: *Brass* 19653 (CANB).

DISTRIBUTION. North Queensland, from the Cape York Peninsula south to the Atherton Tableland; rain forests, often along streams; sea level to about 600 meters. See MAP 3.

Queensland. COOK DISTRICT: Pascoe River, Horse Creek, *Hyland* 6435 (CANB); West Claudie River, *Hyland* 6180 (CANB); Claudie River, *Hyland* RFK 2708 (QRS); Iron Range, *Brass* 19653 (CANB, holotype; L, isotype); McIlwraith Range, *Smith* 11831 (BRI, L); Rocky River, *Hyland* RFK 2555 (BRI, QRS); Mt. Cook, near Cooktown, *Smith* 10593 (BRI), *Webb & Tracey* 7048 (BRI); Mossman Gorge, *Hyland* RFK 1129 (QRS), *Webb & Tracey* 7047 (BRI); Forest Reserve 1073, Smithfield, N of Kuranda, *Dansie* 1935 (QF 62/41) (BRI); Crystal Cascades, near Cairns, *Webb & Tracey* 8194 (BRI); Yarrabah, *Michael* 435 (BRI, GH, NSW); above Copperlode Falls Dam Site, *Stocker* 976 (CANB); State Forest Reserve 607, Lock Logging Area, *Irvine* 758 (CANB).

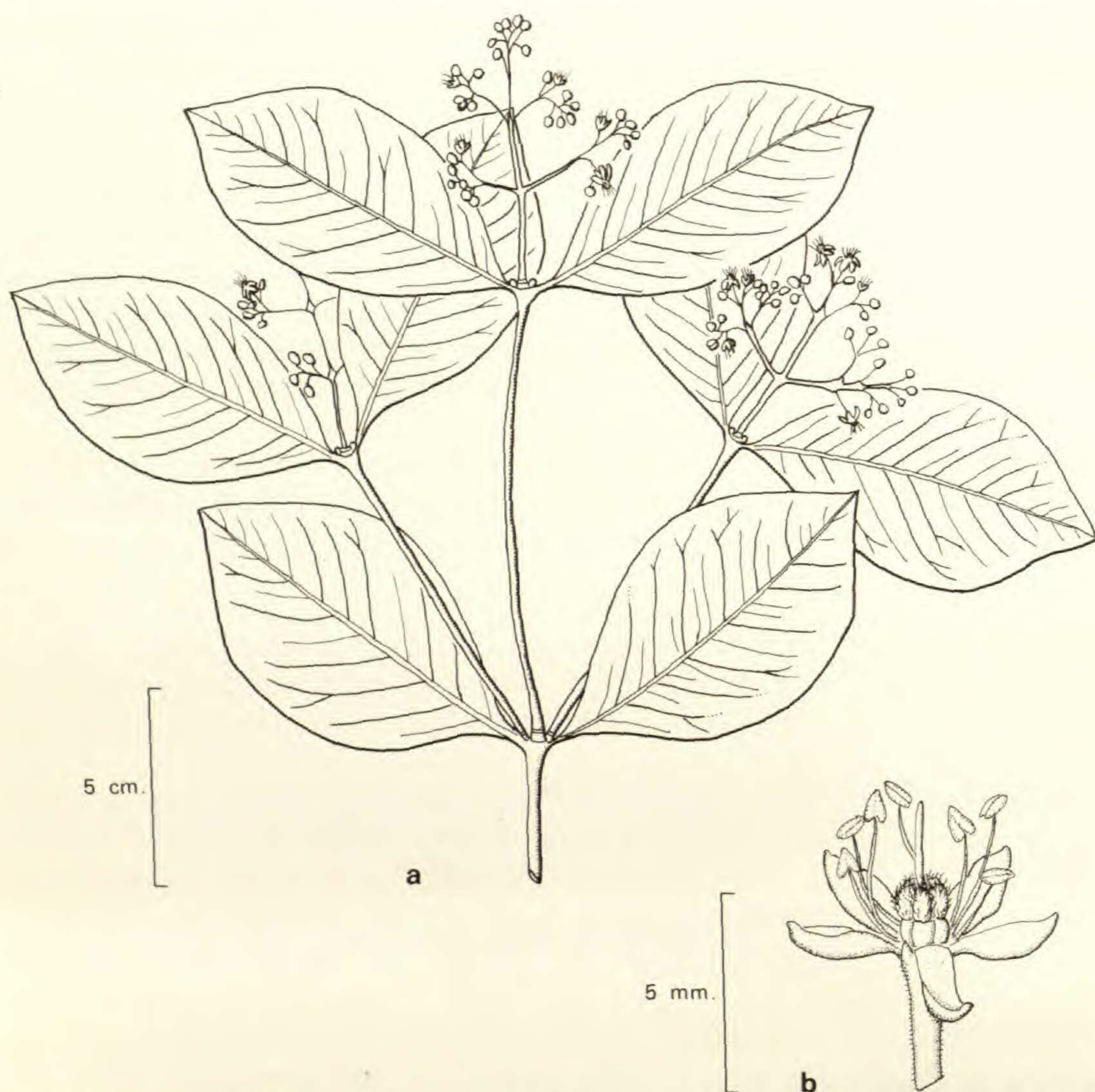


FIGURE 4. *Bosistoa brassii* Hartley var. *brassii*: a, flowering branchlet; b, flower with three stamens removed (both drawn from Brass 19653).

A Stephen Johnson collection of *Bosistoa brassii* var. *brassii* (MEL), labeled "upper Gilbert River, 1894," is omitted from the above list because the locality is unlikely. The Gilbert River is on the western side of the Dividing Range, in north Queensland, and flows into the Gulf of Carpentaria.

7b. *Bosistoa brassii* Hartley var. *proserpinensis* Hartley, var. nov.

Arbor parva usque ca. 12 m. alta; ramulis glabris; gemmis glabris; cicatricibus perularum interiorum delapsarum ex cicatricibus perularum exteriorum delapsarum proxime super; foliis unifoliolatis, 5–9 cm. longis; petiolo 1–2.5 mm. longo; foliolo subcoriaceo vel coriaceo, glabro, ovato vel elliptico, 4.5–8.5 cm. longo, 2.5–5 cm. lato, basi obtuso vel rotundato vel subcordato, aequilatero, margine integro, apice obtuso vel acuto, venis primariis utrinsecus costa 11–12; inflorescentia terminali, 7–9 cm. longa,

glabra; floribus ca. 4 mm. longis; sepalis margine ciliatis, aliter glabris, basaliter connatis, anguste triangularibus, 0.5–1 mm. longis; petalis abaxialiter apicem versus puberulis, adaxialiter glabris, ellipticis, ca. 3 mm. longis; staminibus filamentis sublinearibus, antheris ca. 0.8 mm. longis; disco glabro, pulvinato, 0.3–0.4 mm. alto; ovario glabro, ca. 0.8 mm. alto, ovulis in quoque loculo 4–6; stylo glabro, 1.5 mm. longo; folliculis non visis. HOLOTYPE: *Jones 3857* (CANB).

DISTRIBUTION. East central Queensland, North Kennedy District; foothill rain forests. See MAP 3.

Queensland. NORTH KENNEDY DISTRICT: Mt. Dryander, *Jones 3856* (BRI), 3857 (CANB, holotype), *Moriarty 969* (BRI, CANB); State Forest Reserve 299, Conway Logging Area, *Hyland RFK 4066* (CANB).

The localities cited for this variety are both in the general vicinity of the town of Proserpine; hence the choice of the epithet *proserpinensis*.

Bosistoa brassii is a close relative of both *B. monostylis* and *B. medicinalis*. The pubescence of the ovary in var. *brassii* is similar to that of *B. monostylis*, and the leaves of var. *proserpinensis* are similar in size, shape, and length of petiole to those of some of the unifoliolate specimens of *B. medicinalis*.

EXCLUDED SPECIES

Bosistoa euodiiformis F. Mueller, Frag. Phytogr. Austral. 9: 174. 1875 = *Acradenia euodiiformis* (F. Mueller) Hartley, Jour. Arnold Arb. 58: 176. 1977.

Luerssenidendron monostylis Domin, Bibliot. Bot. 22(89): 289. t. 29. 1927 = *Acradenia euodiiformis* (F. Mueller) Hartley, *ibid.* As I pointed out in my revision of *Acradenia*, Domin informally, and incorrectly, referred this species, the sole species of the genus *Luerssenidendron*, to *Pagetia monostylis* F. Mueller. He was followed in this by Engler (in Engler & Prantl, Nat. Pflanzenfam. ed. 2. 19a: 214, 359. 1931). More recently, Burbidge (Dict. Austral. Pl. Genera 219. 1963) incorrectly placed *Luerssenidendron* in synonymy under *Pagetia*.

ACKNOWLEDGMENTS

I wish to thank the directors and curators of the herbaria listed in the introduction for making specimens in their care available to me. Thanks are also extended to A. G. Floyd, of the New South Wales Forestry Commission Station at Coffs Harbour, and B. P. M. Hyland, of the C.S.I.R.O. Division of Forest Research, Queensland Regional Station, Atherton, for their special efforts in collecting material for me.

INDEX TO EXSICCATAE

The numbers in parentheses refer to the corresponding species and varieties in the text.

- Blake 17387 (1a).
Brass 19653 (7a).
Dallachy 287, 297 (1b).
Dansie 1935 (QF 62/41) (7a).
Dietrich 643, 1436, 1544, 1768, 2212 (6).
Fraser 134 (3).
Hayes, Turner, & McGillivray 2554 (1a).
Henderson 156 (1a).
Herb. Hance 10552 (1b).
Hyland RFK 1129, RFK 2555, RFK 2708 (7a); RFK 4066 (7b); RFK 4071, RFK 4072 (1c); 6180, 6435 (7a).
Irvine 758 (7a).
Jones 3216 (1c); 3288 (2); 3856, 3857 (7b).
Macpherson 122 (*North Qld. Herb.* 4409) (1c).
Michael 435 (7a); 708 (1c).
Moore 212 (2).
Moriarty 968 (1c); 969 (7b); 1641 (2); 1642, 1643, 1644 (3).
Nugent 11 (1c).
O'Shanesy 86 *ser.* 9 (1b); 247 (6).
Petrie 8a. (3).
Scortechini 168 (1a); 305 (1b).
Smith 5137 (3); 10593, 11831 (7a).
Smith & Webb 3121 (2); 3134 (3).
Stocker 976 (7a).
Thorogood 7 (6).
Webb & Tracey 7047, 7048, 8194 (7a); 10067 (1c).
White 1912 (1a); 1940 (3); 10370 (1a).

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